## REMARKS/ARGUMENTS

Claims 1, 2, 5-8, and 11-17 are under consideration, with claims 3, 4, 9, and 10 being withdrawn from consideration.

The undersigned would like to thank the Examiner for the courtesy of a telephone interview on September 28, 2004, to discuss the claims currently under consideration. In that interview, the Examiner indicated that amended claim 6 of the present amendment should overcome the 35 U.S.C. 112 rejection. The 35 U.S.C. 102(b) rejection of claims 1-2, 7-8, 11/7, 11/8, 12/7, 12/8, 13/7, 13/8, 14/7, 14/8, and 15-17 based on the Hendrix reference was discussed. In particular, the inability of the Hendrix device to allow passage of BIT signals to the fiber optic channels (10) and pyrotechnic devices (12) while the device is in unsafe, firing mode was discussed. Agreement was not reached. A request for reconsideration of the finality of the Office Action was also made.

The Amendments to the Claims

Claim 5 has been amended to depend from claim 1 rather than claims 1-4.

For improved clarity, Claim 6 has been amended to specify that the method includes the step of designating two unsafe messages, rather than at least two unsafe messages.

Claims 11-14 have been amended to depend from claim 7, rather than claims 7-10.

It is believed that no new matter has been added by any amendment to the claims.

## THE REJECTIONS

The 35 U.S.C. 112 Rejection

Claim 6 was rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Office Action states:

> Claim 6 states in line 3 that there are at least two unsafe messages which implies that there can be 2 or more unsafe messages and then in line 12 states "the two designated unsafe messages" which implies that only 2 unsafe messages are claimed and therefore it is unclear to how many unsafe messages are being claimed in applicant's claimed invention.

The present amendment at line 3 of claim 6 is believed to obviate the rejection of claim 6. Applicants respectfully request reconsideration and withdrawal of the rejection of claim 6.

The 35 U.S.C. 102(b) Rejections

Claims 1-2, 7-8 and 11/7, 11/8, 12/7, 12/8, 13/7, 13/8, 14/7, 14/8, and 15-17 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,404,820 to Hendrix. Applicants respectfully traverse the rejection. The Office Action states:

> In regards to claim 1, Hendrix discloses a method of controlling a blasting network (10) which includes an assembly of detonators, the method including the steps of designating at least one unsafe message, placing a communication link between a control unit (16) and the network in a control mode in which the communication link is monitored for the unsafe message, in said control mode preventing the unsafe message, when detected, from reaching the blasting network, and placing the communication link in an operational mode in which any previously designated unsafe message is allowed to reach the blasting network, and wherein in both the control mode and the operational mode any message which has not been designated as unsafe is permitted to be transmitted via the communication link, in figures 1, 4, and 5, in column 3, lines 22-28, column 4, lines 19-22 and lines 46-68, column 5 lines 1-12, lines 28-33, lines 45-55, and lines 66-68, and column 6, lines 1-5 and lines 38-41.

In regards to claim 2, Hendrix discloses a method wherein the control mode of the communication link the or each unsafe message is prevented from reaching the assembly of detonators by preventing the onward transmission of the unsafe message in column 4, lines 46-52.

In regards to claim 7, Hendrix clearly discloses a system for controlling a blasting network (10) which includes an assembly of detonators-at (12),(15), the system including a control unit (16) and a communication link for the network, the communication link being capable of being placed in a control mode and in a operational mode, and a monitoring device (6) for monitoring the communication mode for at least one previously designated unsafe message, wherein the communication link in its control mode prevents any detected unsafe message from being transmitted to the blasting network and in its operational mode permits any previously designated unsafe message to be transmitted to the assembly of detonators, and wherein in both its control mode and its operational mode the communication link permits any message which has not been designated as unsafe to be transmitted via the communication link, in figures 1, 4, and 5, in column 3, lines 22-28, column 4, lines 19-22 and lines 46-68, column 5 lines 1-12, lines 28-33, lines 45-55, and lines 66-68, and column 6 lines 1-5 and lines 38-41.

In regards to claim 8, see rejection for corresponding parts of claim 2, above.

In regards to claims 11/7 and 11/8, Hendrix discloses wherein the control unit is capable of generating legal unsafe messages, which are transmitted via the communication link in its operational mode, in column 4, lines 46-52.

In regards to claims 12/7 and 12/8, Hendrix discloses wherein the monitoring device is a filter, in column 3, lines 30-38 and column 4, lines 41-45.

In regards to claims 13/7 and 13/8, Hendrix discloses wherein the communication link is placed in its control and operational modes by means of a switch (32), in column 4 lines 46-52.

In regards to claims 14/7 and 14/8, Hendrix discloses a blasting system including a control system connected to a blasting network (10) including an assembly of detonators (12), (15), in figure 1,

column 4 lines 63-68, column 5 lines 1-12, lines 28-33, lines 45-55, lines 66-68, and column 6 lines 1-5.

In regards to claim 15, Hendrix discloses a blasting system including a control system connected to a blasting network (10) wherein the control unit (16) of the control system for controlling the blasting network is capable of generating legal unsafe messages, which are transmitted via the communication link in its operational mode, in figure 1, column 4 lines 46-52, lines 63-68, column 5 lines 1-12, lines 28-33, lines 45-55, lines 66-68, and column 6 lines 1-5.

In regards to claim 16, Hendrix discloses blasting system including a control system for controlling a blasting network, connected to the blasting network (10) wherein the monitoring device (6) of the control system is a filter, in figure 1, column 3 lines 30-38, column 4 lines 41-45, lines 63-68, column 5 lines 1-12, lines 28-33, lines 45-55, lines 66-68, and column 6, lines 1-5.

In regards to claim 17, Hendrix discloses blasting system including a control system for controlling a blasting network, connected to a blasting network (10) wherein the communication link of the control system is placed in its control and operation modes by means of a switch (32) in figure 1, column 4 lines 46-52, lines 63-68, column 5 lines 1-12, lines 28-33, lines 45-55k lines 66-68, and column 6 lines 1-5.

Hendrix discloses a laser-initiated ordnance controller (LIOC) in which a laser beam is used for explosive ignition. During operation, the LIOC receives command signals from a control panel or remote computer of a flight system that provides Built-in-Test (BIT), Arm, and Fire commands (col. 2, lines 12-15). Hendrix's pyrotechnic ordnance firing system has two light sources (2 and 11 in Figure 1), a high power laser (2) (col. 3, line 29) and a relatively low power (1mW) BIT LED (11) (col. 6, lines 17).

In the safe condition of Hendrix's system, energy from the BIT diode emitter (11 in Figure 1, 38 in Figure 4) is usually directed through a polarization switch (3 in Figure 1, 32 in Figure 4) and an acousto-optic (AO) deflector (6 in Figure 1, 34 in Figure 4) to BIT diode detector (7 in Figure 1, 39 in Figure 4). In this mode, both the polarization switch and the AO deflector are in the off condition (col. 4, lines 55-60). However, as described in column 6, lines 2-25,

the energy from the BIT diode emitter can be directed by the AO deflector into the multiple fiber optic channels (10) to test them. This allows testing of the optical path from the BIT diode to each pyrotechnic device (12). The optical path from the BIT light source to each pyrotechnic device can be checked by sending a short pulse of BIT light through the AO deflector into the fiber optic distribution system. Optical energy is reflected from the pyrotechnic device window, specially coated to reflect the BIT wavelength (col. 6, lines 2-25). The energy from the laser (2 in Figure 1, 30 in Figure 4) may also be tested in the safe condition of the system, with the laser energy being directed by the safe and arm device into a photodetector (col. 4, lines 52-55, col. 6, lines 44-50).

When it is desired to fire Hendrix's ordnance system, the polarization switch is adjusted to permit the energy from the laser (2 or 30) to pass and prevent the energy from the BIT diode from passing and the AO deflector is also adjusted by the system electronics to deflect the energy from the laser into the fiber optic channels (col. 4 line 63 through col. 5 line 12).

In the Examiner's discussion of Hendrix, Hendrix's multiple fiber optic channels (10) (col. 3, lines 28-29) have been equated to the blasting network of the present invention and Hendrix's pyrotechnic devices (12) and pyrotechnic device windows (15) to the detonators of the present invention. The present invention relates to either passage and/or prevention of passage of unsafe messages and messages which have not been designated as unsafe to the assembly of detonators. Therefore, the Hendrix commands relevant for comparison with the messages of the present invention are those which can result in the transmission of a signal to the Hendrix's pyrotechnic devices or pyrotechnic device windows. The two Hendrix commands which can result in transmission of a signal to the Hendrix's pyrotechnic devices or pyrotechnic device windows are the BIT (built-in-test) and Fire commands, both of which can result in transmission of light to the pyrotechnic devices or device windows. As previously discussed, the polarization switch allows the BIT command to result in

a signal at the pyrotechnic devices or pyrotechnic device windows only when the system is in the safe state. Further, Hendrix's fire command can result in a signal at the pyrotechnic devices or pyrotechnic device windows only when the system is in the armed state (not de-energized or safed). For the purposes of comparison, Hendrix's armed state can be compared to the operational state of the present invention, since both states allow transmission of unsafe Fire messages to either Hendrix's pyrotechnic devices or device windows or the present invention's assembly of detonators.

Claim 1 requires the step of "placing a communication link between a control unit and the network in a control mode in which the communication link is monitored for the unsafe message, in said control mode preventing the unsafe message, when detected, from reaching the assembly of detonators." As defined in the specification at page 2, lines 19-21, "unsafe message" is used to designate a message or command which, if received by the blasting network, could result in unwanted or adverse conditions or consequences. Claim 1 also includes the step of placing the communication link in an operational mode in which any previously designated unsafe message is allowed to reach the assembly of detonators. Furthermore, claim 1 includes the limitation that "in both the control mode and the operational mode any message which has not been designated as unsafe is permitted to be transmitted to the assembly of detonators via the communication link" (emphasis added).

Claim 7 contains the limitation that the communication link in its control mode prevents any detected unsafe message from being transmitted to the assembly of detonators and in its operational mode permits any previously designated unsafe message to be transmitted to the assembly of detonators, and wherein in both its control mode and its operational mode the communication link permits any message which has not been designated as unsafe to be transmitted to the assembly of detonators via the communication link.

Applicants respectfully disagree with the Examiner's statement in Section 5 at page 8 of the April 29, 2004 Office Action that Hendrix's BIT command should be considered an unsafe message. In the present invention, an unsafe message, when received by the blasting network, results in unwanted or adverse conditions or consequences. In Hendrix's system, BIT light is sent through the optical fibers to his pyrotechnic devices and pyrotechnic device windows without adverse consequences as part of routine optical path testing. The BIT light is reflected by the pyrotechnic device window (col. 6, lines 9-11) and the relatively low power of the BIT diode is believed to be insufficient to ignite Hendrix's ordnance. In view of the foregoing, Applicants submit that in Hendrix's system, Hendrix's BIT command is not an unsafe message. Therefore, Hendrix's system fails to teach the limitations of claims 1 and 7. In particular, claims 1 and 7 specify that in operational mode any message that has not been designated as unsafe is permitted to be transmitted to the assembly of detonators. When Hendrix's device is the armed state in which the laser pulse can be transmitted through the device, Hendrix's device cannot transmit safe BIT commands.

From an alternate viewpoint, if Hendrix's BIT command is considered an unsafe command, Hendrix teaches only transmission of unsafe commands (BIT, Fire) to his assembly of pyrotechnic devices or device windows. As a result, Hendrix fails to teach a control mode in which safe messages are permitted but unsafe messages are prevented from reaching his assembly of pyrotechnic devices or device windows. From this viewpoint, Hendrix's system therefore fails to teach the limitations of claims 1 and 7. In particular, claims 1 and 7 specify that in control mode safe messages are permitted but unsafe messages are prevented from reaching the assembly of detonators.

In view of all the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1 and 7. Since claim 2 depends from claim 1 and contains all the limitations of claim 1 and claims 8 and 11-17 ultimately depend from claim 7 and incorporate all the limitations of claim 7,

Applicants respectfully request reconsideration and withdrawal of the rejection of claims 2, 8 and 11-17.

The 35 U.S.C. 103 Rejections

Claims 5/1, 5/2 and 6 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hendrix in view of U.S. Patent 5,756,924 to Early. The office action states:

> Regarding claims 5/1 and 5/2, Hendrix discloses the claimed invention, except for illustrating that the method of designating an unsafe message include two unsafe messages. Early teaches in figure 4, column 3 lines 55-60, column 7 lines 49-54 and lines 58-76 and column 8 lines 1-4 and lines 46-52, that a first laser (34) is used to provide a high power peak short duration pulse and that a second laser (36) is used to provide a low peak power long duration pulse, which are combined in order to regulate the rate and duration of laser energy delivery. It would have been obvious to one of ordinary skill in the m at the time the invention was made to employ Early's method of combining the energy of two lasers in order to achieve the desired effect of an optimal ignition performance.
>
> In regards to claim 6, Hendrix discloses a method of controlling a blasting network (10) which includes an assembly of detonators, the method including the steps of designating an unsafe message, placing a communication link between a control unit (16) and the network in a control mode in which the communication link is monitored for the unsafe message, in said control mode preventing the unsafe messages, when detected, from reaching the assembly of detonators and placing the communication link in an operational mode in which any previously designated unsafe message is allowed to reach the assembly of detonators, and wherein in both the control mode and the operational mode any message which ahs not been designated as unsafe is permitted to be transmitted to the assembly of detonators via the communication link and wherein the designated unsafe message is respectively equated with arm and fire commands, in figures 1, 4 and 4, in column 3 lines 22-28, column 4 lines 19-22, and lines 46-68, column 5 lines 1-12, lines 28-33, lines 45-55, and lines 66-68, and column 6 lines 1-5 and lines 38-41. Hendrix discloses the claimed invention, except for illustrating that the method of designating an unsafe message includes two unsafe messages. Early teaches in figure 4, column

> 3, lines 55-60, column 7 lines 49-54 and lines 58-67, and column 8 lines 1-4 and lines 46-52, that a first laser (34) is used to provide a high power peak short duration pulse and that a second laser (36) is used to provide a low peak power long duration pulse, which are combined in order to regulate the rate and duration of laser energy delivery. It would have been obvious to one of ordinary skill in the m at the time the invention was made to employ Early's method of combining the energy of two lasers in order to achieve the desired effect of an optimal ignition performance.

Early relates to a multiple laser pulse ignition method and apparatus. Early teaches contacting of a fuel with a short duration laser pulse to form a plasma and to initiate fuel combustion followed by contacting said plasma with a long duration laser pulse, thereby stabilizing and sustaining said fuel combustion (col. 2, line 64 through col. 3, line 3). Early further teaches that use of two or more laser light pulses with certain differing temporal lengths and pulse powers can be employed in sequence to regulate the rate and duration of laser energy delivery to fuel mixtures, thereby improving fuel ignition performance over a wide range of fuel parameters (col. 3, lines 56-61).

Claim 5 includes all the limitations of claim 1. As previously discussed, Hendrix does not teach all the limitations of claim 1. Early does not teach the step of placing a communication link between a control unit and the network in a control mode in which the communication link is monitored for the unsafe message, in said control mode preventing the unsafe message, when detected, from reaching the assembly of detonators. Early also does not teach the step of placing the communication link in an operational mode in which any previously designated unsafe message is allowed to reach the assembly of detonators. Early further fails to teach that in both the control mode and the operational mode any message which has not been designated as unsafe is permitted to be transmitted to the assembly of detonators via the communication link. Therefore, the references cited, both singly and in combination fail to teach all the limitations of claim 1, from which claim 5 depends. Applicants respectfully request reconsideration and withdrawal of the rejection of claim 5.

As previously discussed, Hendrix does not teach all the limitations of claim 1, from which claim 6 depends. Early does not teach the step of placing a communication link between a control unit and the network in a control mode in which the communication link is monitored for the unsafe message, in said control mode preventing the unsafe message, when detected, from reaching the assembly of detonators. Early also does not teach the step of placing the communication link in an operational mode in which any previously designated unsafe message is allowed to reach the assembly of detonators. Early further fails to teach that in both the control mode and the operational mode any message which has not been designated as unsafe is permitted to be transmitted to the assembly of detonators via the communication link. Therefore, the references cited, both singly and in combination fail to teach all the limitations of claim 1, from which claim 6 depends.

Claim 6 further contains the limitations that two unsafe messages are designated and that these two unsafe messages are arm and fire commands. Applicants again note that the present invention requires that in operational mode any previously designated unsafe message is allowed to reach the assembly of detonators. As previously discussed, the two Hendrix commands which can directly result in transmission of a signal to the Hendrix's pyrotechnic devices or pyrotechnic device windows are the BIT (built-in-test) and Fire commands, both of which can result in transmission of light to the pyrotechnic devices or device windows. Hendrix's Arm command does not directly result in transmission of light to the pyrotechnic devices or device windows. Therefore, Hendrix does not teach that in armed mode both unsafe arm and fire commands are allowed to reach his equivalent of the assembly of detonators. Although Early teaches the use of two laser pulses in sequence, Early fails to teach transmission of an unsafe arm command to his fuel. The combination of Early and Hendrix also fails to teach that in operational mode any both unsafe Arm and Fire commands are allowed to reach the equivalent of an assembly of detonators. Therefore, the

cited references, both singly and in combination, fail to teach all the limitations of claim 6.

In view of all the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejection of claim 6.

The Withdrawn Claims

It is believed that the rejections of generic claim 1 have been overcome. Therefore, applicants respectfully request rejoinder of claims 3, 4, 9 and 10, which were withdrawn from consideration.

Request for Withdrawal of Finality of the Office Action of April 29, 2004

The Examiner has stated that claim 6 as amended in the response of January 15, 2004 has contains new subject matter and therefore is materially different and has a different scope from the original claims and thus can be under final rejection. The example given is the amendment of claim 6 to specify that the blasting network includes an assembly of detonators.

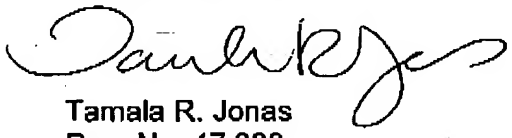
Applicants respectfully disagree that the amendment of claim 6 to clarify that the blasting network includes an assembly of detonators adds new matter to the claims and leads to the amended claim having a different scope than the original claim. The blasting network is defined at page 4 line 20 as "consisting of an assembly of detonators and communication devices...". Therefore, the fact that the blasting network included an assembly of detonators was inherent in the original claim. In view of the foregoing, applicants respectfully request reconsideration and withdrawal of the finality of the above-referenced Office Action.

## CONCLUSION

This application being in condition for allowance passage to issuance is respectfully requested.

It is believed that a fee of $420, for a two month extension of time, is due with this submission. Please deduct this fee from deposit account 07-1969. If this amount is incorrect, please credit any overpayment or deduct any required fee, including any fee due for extension of time, from deposit account 07-1969.

Respectfully submitted,



Tamala R. Jonas
Reg. No. 47,688

Greenlee, Winner and Sullivan, P.C.
5370 Manhattan Circle, Suite 201, Boulder, CO 80303
Telephone: (303) 499-8080; Facsimile: (303) 499-8089
Email: winner@greenwin.com
Attorney docket no. 114-01
TRJ:lem:9/29/04